

1 INVENTION: Method and Apparatus for Creating Unique Image
2 Passwords

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6 BACKGROUND OF INVENTION:

7 This invention is directed to the art of computer security.
8 In recent years, security of computers has become significantly
9 important, not only because of the proliferation of the use of
10 computers, but also with the rise of interest in the Internet and
11 potential access to individual computers from the Internet.
12 Current and popular password schemes are often compromised due to
13 an Internet hacker's knowledge that the characters making up the
14 password are universal on every standard keyboard, since most
15 keyboards utilize the common ASCII code.

16 The current invention is intended to take advantage of
17 currently available graphic programs and utilize a keypad device
18 with keypad and computer disc "keys" that allow for specific
19 detailed graphical key images stored thereon that would be
20 difficult, if not next to impossible, to recreate by typical trial
21 and error.

22 The current invention utilizes color digital images, graphic
23 images commonly available by design or by scanning in (such as
24 utilizing a picture of one's own pet) that become passwords unique
25 to the user. Paint programs and scanner programs that are readily
26 available on nearly all computer platforms work compatibly with the
27 instant invention to allow use of graphic image passwords.

28 The envisioned keypad device is comprised of an external
numeric keypad, a display, a removable media device (for example

1 floppy disks or CD Roms) that will have discs that act as "keys"
2 having the graphic images thereon, and internal memory. The keypad
3 device has non-volatile internal memory capable of storing the
4 graphic image password once it is created by the user, and in fact
5 in the preferred mode, the graphic user password is comprised of a
6 series of images that are stored in the device with each image
7 assigned to a key (0 through 9) on the device in a sequence
8 specified by the user. This sequence is then replayed with the
9 disk in place, to enable access to the computer. As a secondary
10 security measure, the computer floppy drive or removable storage
11 device will have placed therein its own floppy disk or CD Rom with
12 a second graphic password (or non-image, if preferred) assigned to
13 the computer keyboard, in a sequence fashioned much like the keypad
14 device, such that the keypad device password and the computer
15 password are necessary to gain access to the computer. These two
16 passwords help prevent a would-be intruder otherwise placing his
17 own keypad device that would otherwise send a "go" code to the
18 computer.

19 Consequently, the user must have a disk having both passwords
20 thereon (or two separate disks) with images that match the images
21 stored in memory loaded in the media device each time the log-in
22 attempt is tried or whenever the computer is powered up. In the
23 alternative mode, the media device would also be able to be shared
24 on a network through the input/output port.

25 The external keypad device will store both the images in
26 password sequence and thus validate the sequence typed by the user
27 attempting to gain access. In the preferred mode of the invention,
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1 multiple failed accesses will disable the computer for a period of
2 time.

3 The external keypad device is further designed to connect to
4 a standard computer through the many different interfaces
5 available, including serial, parallel, ethernet, keyboard ports,
6 and USB ports.

7 Consequently it will be seen that what is shown is an ultra
8 secure highly personalized password device and method that allows
9 a user not only to have the user's own selected graphical keywords,
10 but also allows the use of current graphical programs and utilizes
11 the computer's current input/output ports, and further creates a
12 highly secure apparatus and method.

13 Other objects and features of the invention and the manner in
14 which the invention achieves its purpose will be appreciated from
15 the foregoing and the following description and the accompanying
16 drawings which exemplify the invention, it being understood that
17 changes may be made in the specific method and apparatus disclosed
18 herein without departing from the essentials of the invention set
19 forth in the appended claims.

DESCRIPTION OF THE DRAWINGS:

Figure 1 is a shows the computer system and the keypad device.

Figure 2 is a block diagram of the keypad device connected to the block diagram of the computer system.

Figure 3 is a block diagram of the computer program modules for the invention.

Figure 4 is a flow chart for loading the respective image password.

Figure 5 is a block diagram of a flow chart for gaining access to the computer system through the keypad device utilizing the password and password sequence.

DESCRIPTION OF THE PREFERRED EMBODIMENT:

The apparatus is shown in Figure 1 in the preferred mode and in block diagram form in Figure 2. In Figure 1, the keypad device 7 is shown in the preferred form adjacent to the computer keyboard 5 although any particular placement is envisioned that allows easy access by the user. The term Keypad Device is used herein refers to the physically separate device shown in Figure 1. Keyboard as used herein refers to the computer keyboard 5.

The keyboard device 7 has display means 13 for displaying alphanumeric figures for prompting the user and for displaying status. Push button keys 15 are essentially the standard 0 - 9 keys along with any desired extra keys that may be envisioned to carry out the program on the device. The keypad device also has floppy disk or other removable storage means 17. The floppy disk 19 is shown, however, it should be understood that any removable storage device is envisioned including CD Roms.

The device is connected via cable 14 to the computer input/output ports. These can be any standard computer input/output ports including parallel, serial, ethernet or even standard USB ports. In the preferred mode, the standard USB port is envisioned.

The computer system is comprised of a standard PC, but can be any computer system having the block diagram content shown in Figure 2. The computer system is comprised of a monitor 3, computer with motherboard, input/output port, internal hard drive or other permanent storage means, with CD Rom 9 and/or floppy disk media device 11, and further has a typical keyboard 5 having

1 alphanumeric keys 23 and a numeric keypad 21. The keyboard is
2 connected to the computer via cable 12. A mouse is also envisioned
3 and is commonly used to construct any images in typical paint or
4 other graphic display programs.

5 It should be understood that graphic display programs, include
6 those programs commonly available on the market such as paint
7 programs like MICROSOFT PAINT, COREL DRAW, ADOBE, and also includes
8 scanner programs and the ability to scan in to the computer any
9 images from a separate scanner device.

10 The block diagram shown in Figure 2 has two portions, the
11 computer block diagram 51 and the keypad device block diagram 21.
12 The keypad device 21 has input/output means 35, removable media
13 device 39 (shown as 17 in Figure 1), keypad interface 23 (shown as
14 15 in Figure 1), display means 25 (shown as 13 in Figure 1), all
15 interfacing with the central processing unit 33. RAM memory 30 also
16 interfaces with the processor as does non-volatile memory 28 (for
17 receiving and permanently storing device image passwords). ROM
18 memory 24 has therein the device program memory stored necessary to
19 operate the keypad device. Permanent battery means 26 is
20 electrically connected to the RAM memory to the extent the memory
21 requires constant voltage. However, other non-volatile memory means
22 are envisioned for 28 including magnetic cards or rewritable
23 storage media.

24 The keyboard device is connected to the computer in Figure 2
25 via cable 37 showing the connections between the respective
26 input/output devices 35 and 59. The computer block diagram 51
27 reflects a fairly standard computer block diagram having a CPU,
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1 controlling the various parts including the permanent hard drive
2 57, display means 55, keyboard interface 53 and removable means
3 device 61. The removable media device 61 can be any removable media
4 device capable of storing the respective computer image password
5 envisioned by the inventor. The permanent hard drive 57 can be any
6 magnetic or other media storing internally the corresponding
7 computer password image that will match and correspond to that on
8 the removable media device disk 61.

9 In use, the computer program is installed initially on the
10 computer on the permanent hard drive 57 and once installed, need
11 not be used again so long as the program remains stored on the
12 permanent hard drive. In the installation process, the program
13 accesses the internal computer user definable startup programs and
14 installs the necessary code to direct the user at startup to the
15 security startup screen. In MS-DOS based PC's for example, the
16 AUTOEXEC.BAT file and the CONFIG.SYS file might be used, although
17 other methods of directing the user to the security login screen
18 are envisioned. The object is to insert the proper code to draw up
19 the program upon computer star before allowing any further access
20 to the computer, and also prior to any log-in attempt if the
21 computer is connected to a network. If the inventive process is
22 utilized to prevent access to specific programs, or even the
23 internet, the access modules of those programs are revised to
24 insert the proper code to direct the user to the security login
25 screen. In essence, the computer program or the device is
26 comprised of four essential modules, an installation module
27 utilized for installing the program initially, an
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1 initialize/recognize module that is readily on call when the
2 computer is turned on for signing on, a create/edit module that
3 allows for creation or editing of image passwords and provides for
4 calling up of standard paint or other graphic image programs, and
5 a store/download module for storing the selected passwords in the
6 respective computer/keypad permanent memory and also storing in the
7 respective removable storage media drive. These modules are shown
8 respectively in Figure 4.

9 To create or edit a graphic display, one simply calls up the
10 respective module which then calls up the respective standard paint
11 program or other scanner software if an image is intended to be
12 scanned in as a password image. When the password image is
13 finalized, the image is then downloaded utilizing the
14 store/download module and the image is stored. In particular, an
15 image can be the same image and same password image for both the
16 computer and the keypad device or it can be two separate images.
17 The desired password image is stored in the desired location in the
18 keypad device non-volatile memory, and the computer password is
19 stored in the computer hard drive or other permanent means. In the
20 preferred mode, these stored images are stored in a non-typical
21 format (other than bitmap, TIFF, etc.) so as to reduce the
22 possibility of discovery by third parties. The images are
23 ultimately compared, pixel for pixel.

24 The respective passwords are also stored on the respective
25 floppy (keypad floppy and computer floppy). It should be kept in
26 mind that any floppy as used herein refers to any removable storage
27 medium device.

1 The user then removes the two floppies, or if desired, the
2 same floppy can be used for both the keypad device and the
3 computer.

4 However, in the preferred mode, it should be understood that
5 each password consists of a series of images and the store/download
6 module provides for creating a desired recall of the sequences of
7 the images of that must be repeated upon sign in to successfully
8 log on. It should also be understood that during the download
9 process, each image is assigned to a separate key selected by the
10 user on the respective keypad or keyboard. For example, a user
11 wanting to use a photograph of their child and their pets, or a
12 personal doodle or scribble will store them as separate images and
13 assign them during the download process to their respective key on
14 the keypad and this sequence must be remembered inasmuch as the
15 keypad memory also recognizes the proper sequence. If the user
16 selected keypad number 8 to represent the pet, keypad number 7 to
17 represent the personal doodle and keypad number 2 to represent the
18 scribble, the proper sign in sequence would then be 8, 7, 2.

19 When turning the computer on or signing in, the user is
20 brought to the initialize/recognize module menu prompting the user
21 to enter into the computer the respective proper code and sequence.
22 The same process is used for the keypad wherein the keypad display
23 prompts the user to insert the floppy "key" which contains the
24 images, as does the floppy "key" for the computer, and the keypad
25 prompts the user to insert the proper sequence on the keypad. If
26 the proper password and sequence is provided, and after a pixel by
27 pixel comparison, the keypad sends a Grant Access Signal (GAS) to
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1 the computer via the standard USB (or other desired port),
2 satisfying condition 1 for the computer to allow access to the
3 user. Condition 2 is met if the proper image code and sequence is
4 entered into the computer keyboard. It should be noted that either
5 the keypad password device or the computer password device may be
6 entered first, although in the preferred mode, the order of entry
7 would be to enter the computer password first. It should also be
8 noted that the computer password can be an alphanumeric password.
9 Consequently the entire invention allows for a unique combination
10 of image and alphanumeric passwords to be used at the user's
11 discretion.

12 If the password in the keypad device is not valid, the
13 following sequence occurs: the user is prompted by the keypad
14 display if the login failed, and the count for maximum retries is
15 incremented, a check for maximum login attempts is performed and if
16 the total number of login tries for the current login session is
17 less than or equal to the maximum login tries allowed, the user is
18 prompted by the keypad display to retype the password, restarting
19 the process. However, if the total number of login tries is more
20 than the maximum number of login tries allowed, the user is denied
21 access for a pre-designated period of time. This predesignated
22 period of time is designated by the user in seconds, minutes, hours
23 or other period, at the time of installation of the program, and
24 this particular number resides in permanent memory on the keypad
25 device.

26 The processor executes the program and directs the input and
27 output that occurs with the input/output device, the media device,
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1 keypad display and keypad interface, along with various keypad
2 memories. After access has been granted, the keypad device can be
3 powered down and unplugged.

4 The process described is as set forth in Figures 3 and 4.

5 In another mode of the invention, the keypad device operates
6 alone and independently without the need for a computer password.
7 However, in the preferred mode, the addition of the computer
8 password process enhances the security of the program.

9 Consequently, what is disclosed is a method and apparatus for
10 providing a highly secure process and environment for a computer
11 in/or network and allows the user a much broader range of passwords
12 in the form of user defined graphic images so as to allow far more
13 creative passwords, reducing chances of unauthorized access, and
14 further provides for all of the above utilizing commonly available
15 graphic programs including paint and scanner programs.

16 While there have been shown and described particular embodi-
17 ments of the invention, it will be obvious to those skilled in the
18 art that changes and modifications may be made without departing
19 from the invention or its equivalent, and, therefore, it is
20 intended by the appended claims to cover all such changes and
21 modifications as fall within the true spirit and scope of the
22 invention.